

Grass Lands....



WHY LEXINGTON IS HORSE CAPITAL

By WAYNE DINSMORE

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The area within a radius of 75 miles from Lexington, Ky., produces most of America's great Thoroughbreds and a substantial proportion of the great Standard Bred race horses. The records of racing prove this, and those who live elsewhere have often asked why it is true.

There are many reasons, but the principal ones are climate, soil and concentration of great sires.

There is no substitute for adequate sunshine, soil suited to produce strong grasses, outdoor life almost the year round, and extensive rolling turf fields where foals, weanlings and yearlings can race at top speed for long distances without danger of injury. The combination of all these factors in what may be termed a happy medium is, in my opinion, the principal reason why race horse breeding in the Lexington district dominates all others.

An irregular area approximately 2,400 square miles in extent about Lexington (including parts of Fayette, Bourbon, Scott, Woodford, Jessamine, Clark, Henry, Mercer, Boyle, Garrard, Anderson and Franklin counties) is a high phosphate soil originating from what is known as the Trenton limestone. It has more available phosphate in the top 10 inches than any other area in America. Maury county, Tenn., is the only other district that even approaches it.

The best land about Lexington has from six to 10 times as much available phosphate as the best corn-belt soils in Iowa or Illinois—so much, in fact, that no gain whatever accrues from the addition of phosphate fertilizers in any form. All the land on the Trenton limestone foundation had an abundance of available lime to begin with, but a century or more of farming and livestock production has depleted the limestone on many farms so much that more must be added to permit the growth of such legumes as clovers and alfalfa. A. B. Hancock's pithy comment, "If you don't have plenty of clover in your pastures, good grass will not long continue," sums up limestone needs in a single sentence.

Good farmers, no matter where, have their soils tested from time to time to see how much lime is needed. Necessary quantities are then added, sufficient to make possible the growth of clovers and alfalfa, which will not grow on soils lacking lime. Lespedeza growth is no guide, for it will grow on acid soils, markedly deficient in lime. So in looking at pastures, the presence of an abundance of clovers and some alfalfa is the best evidence that ample lime is present for maximum growth of young horses.

But other sections can add lime and phosphate till their pastures equal anything in Kentucky—so we must examine other factors.

In the Lexington area, temperate climate prevails (with a mean temperature of 34.7 degrees during the three winter months—December, January and February), where the sun shines strongly enough and at a high enough altitude to protect young animals against rickets for most of the year. Sleet, forming ice on pastures, comes but seldom, and cold, drizzling, winter rains are infrequent. In states farther north and west, such sleet storms frequently prevent use of pastures for days and sometimes for weeks at a stretch, while in states farther south, cold winter rains are much more frequent than near Lexington. Snow is no handicap to pasture use, as horses enjoy runs on snowy grasslands, and paw through the snow to get at bluegrass or grain pastures, which stay green here throughout the entire winter.

Work at the Missouri Experiment Station has proved that green forage in winter, whether it be from bluegrass or grain pastures—winter wheat, barley or rye—has growth-stimulating properties, hence green feed, available much of the winter in the Lexington area does effectively contribute to growth of yearlings and other young horses.

Other areas, however, have green feed through the winter, and many have as much

EDITOR'S NOTE:—Wayne Dinsmore is qualified to write authoritatively on the subject presented here. He grew up on a ranch 35 miles southeast of Rapid City, near the Black Hills of South Dakota, where he rode range through boyhood days, was graduated from the Iowa State College at Ames, was on the animal husbandry staff there for 7 years, Secretary of the Percheron Society of America for 10 years, and for the past 25 years has been Executive Secretary of the Horse and Mule Association of America, Inc.

His duties have taken him to leading stock farms in every state in the union. He knows, first hand, whereof he speaks.

or more sunshine—particularly Texas, Oklahoma and parts of California—so sunshine and green winter pastures are not the determining factor.

Space for Romping

Large fields of springy turf where foals, weanlings and yearlings can race safely at top speed are the rule in Kentucky. Virginia and Maryland also have some of these, but such large pastures are the exception in those states. Texas has them, but throughout much of the year Texas pastures are so dry and hard as to be almost like concrete pavement, hard on the limbs of foals or yearlings racing at will. California, with much rain in winter, often has pastures so soft that horses go fetlock deep or more in soft ground when running, and most of their pastures are dry and hard from June to October.

Irrigated farms—and there are some splendid ones in California and other western states—produce abundant nutritious pastures if adequately fertilized, and far more feed to the acre than Kentucky's best. But their great drawback is lack of size. Small fields of 20 to 40 acres are the rule on most such irrigated pastures and there is lack of room for the wild races possible in Kentucky's 80 to 100-acre fields, or larger ones.

Running in Groups

Race horses are bred to race, and should have every opportunity to do so as foals, weanlings and yearlings. They need fields large enough to permit them to really extend their speed to the utmost, running in groups sufficient in number to develop rivalry, where they become accustomed to jostling and crowding while running. Young horses, so raised, learn to speed away from others, and acquire the knack of recovering balance, changing leads while in full speed, if they are forced to do so because of the crowding of others. This lack of large fields, with springy turf, adequate for 15 or 20 foals, weanlings or yearlings to run and romp together, is a real handicap on most stud farms in California today. In olden days when Lucky Baldwin and Leland Stanford were turning out winners, their lands lay in the large valleys, with fields of a size comparable with Kentucky pastures; but those great pastures are now devoted to other uses, and race horses bred in California are apt to be confined to small fields. There are exceptions, but they are few. On this point, therefore, the Lexington area has an advantage not generally realized over most other areas where Thoroughbreds are being raised.

True, dry summers come now and then at Lexington, when fields become hard and dry during part of the summer, and breeders fear development of splints or worse as the youngsters gallop madly across large fields, but such dry periods are usually short. Most of the year the bluegrass turf is springy and elastic, giving young race horses the bounce of a rubber ball.



Map—adapted from Bulletin No. 193, Kentucky Agricultural Experiment Station—showing by shaded areas, the Trenton limestone high phosphate soils about Lexington, Kentucky.

Concentration of Sires

Last but not least is the concentration of great sires within 75 miles of Lexington. This has come because of gradual recognition of other factors previously discussed. Wealthy men who have tried to raise great race horses elsewhere have finally learned—the hard way, through the expenditure of much money, time and effort—that the Lexington area has worth-while advantages. They have moved their horses to farms based on the Trenton limestone, and have subsequently achieved greater success in a few years than they had achieved in many years elsewhere. They have accordingly purchased or leased farms, moved their horses here and thus have brought more sires into the district while those breeders long situated here have gradually strengthened their own stud stallions, both in number and excellence.

The Lexington area has no monopoly on good race horses. Good ones, winners of great stakes, have been bred and raised elsewhere; but the percentage of winners, especially stake winners, is less in other areas.

Not all the land about Lexington is good. The high phosphate soils derived from the Trenton limestone are irregular in location and extent. One farm may be good, another a mile away decidedly deficient in phosphate and limestone.

A study of soil maps obtainable at the Kentucky Experiment Station, particularly Bulletin No. 25, U. S. Department of Agriculture, entitled Soil Survey of Fayette county, a check on production in past years, obtainable from the county agent and men who have helped harvest any particular farm, and a soil analysis to determine the lime, phosphate, potash and organic content of the land, should precede any farm lease or purchase. Soil tests also should be made from time to time, even on farms long owned; for production is limited by a deficiency in any of these, just as a chain is no stronger than the weakest link.

Grass is no better than the land it grows on. Land with plenty of organic matter holds water better, is more resilient, more springy under running horses, and also is more productive. Every effort should be made, therefore, to bring all pastures up to the level of the best with the widest possible variety of grasses and legumes, in addition to bluegrass. Mixed pastures are more palatable, more productive, and withstand the hot dry weather of midsummer better than bluegrass alone, though bluegrass is the best pasture for year-round use.

Lexington's pre-eminence in race horse production is due to a happy combination of sunshine, soil, moderate climate, sound sense on the part of breeders who keep their animals out on pasture virtually the year round, large pastures of springy turf, favorable to the development of racing speed and balance in foals, weanlings and yearlings, and a concentration of many great sires in a limited area. So long as these advantages are maintained, Lexington will continue to lead.



This map shows the average annual precipitation in different sections of the United States. In the Pacific Coast States great differences in precipitation obtain, the average annual amounts ranging from more than 120 inches in portions of western Washington to less than 5 inches in the extreme southeastern portion

From Atlas of American Agriculture. U.S.D.A.

of California. At the lower altitudes of the Rocky Mountain States there are regions in which the average annual precipitation is less than 10 inches, but at the higher elevations it ranges from 20 to 40 inches, or more. The average annual amount ranges from 60 up to 80 inches in the southern Appalachian Mountains.

The article on the preceding page, which originally appeared in the Lexington Herald Leader January 14, 1945, is reprinted here, not to advertise a part of Kentucky, but to point out what breeders in other areas need to do, to equal such favorable conditions.

The annual precipitation in the Lexington area—from 40 to 50 inches, more than half of which falls between April 1st and September 30th—is shared by many other states, east and west, as shown on map above; but not all have the other advantages mentioned.

Good horses have been and can be raised in any state in the Union. Growth usually is allowed to pursue a normal course on good pastures and choice hays grown on fertile land. Maturity comes at about 5 years of age.

Where it is financially advantageous to hasten maturity, so as to make the animals almost as big at 2 as they ordinarily would be at 5, especially favorable conditions must be provided, approaching as closely as possible those prevailing in the Trenton limestone area.

Good pastures are the cheapest and best of all feeds for livestock. Where rainfall is sufficient, not excessive, and where it comes principally during the growing season, excellent grasslands are possible; for even if the soil, originally fertile, has been depleted, it can be made

productive by suitable rotation of crops and the addition of manures and fertilizers: but without sufficient moisture, even the most fertile lands will not produce adequate feed supplies.

Where there is more than 30 inches of annual precipitation, legumes thrive if there is lime enough to permit, and phosphate enough to stimulate their growth. Legumes if plentiful in pastures will double or treble acre yields; for they take nitrogen from the air and make it available to both legumes and grasses.

When you ride horseback or walk over a pasture and see numerous patches of thick, dark green grass where cattle or horses have voided excrement, you realize that particular pasture needs nitrogen. It can be obtained by making soil conditions suitable for legume growth, renovating such pastures, and obtaining a good stand of legumes; by applying fresh manures, providing there is adequate moisture; or by applying commercial nitrogenous fertilizers. The latter course is quicker, but more costly. Horse manure should not be spread on horse pastures. They do not like to eat over their own excrement. Put horse manure where it will be plowed under and use cattle and sheep manure if available, as a top dressing on pastures, if moisture is ample.

Effect of Weather

Grass depends largely upon moisture during the growing season. Man is unable to control precipitation. Drouths, when they come, leave affected areas deficient of feed and water. Excessive rain, especially in winter, is detrimental to soils devoid of cover, but less disastrous to livestock than drouths.

Weather is variable and uncertain. The Great Plains region, sloping from the foothills of the Rocky Mountains east to the 100th Meridian of longitude, normally has 10 or more inches of annual precipitation on the eastern part of Montana, Wyoming, Colorado and New Mexico, which gradually increases eastward to about 15 inches on a north-south line extended across the United States at the western side of the Dakotas, with further gradual increases to 20 inches, indicated on map; yet there are years when there is far less precipitation.

At Bell Ranch in northeastern New Mexico, the U.S. Weather Bureau figures show the average annual precipitation for 45 years—1899 to 1944 inclusive—was 16.01 inches, most of which came in May to September inclusive; yet variation was extreme, from 5.65 inches in 1934 to 37.96 inches in 1941. In the 3 years 1934-35-36, only 27.61 inches of precipitation came—an average of only 9.2 inches per year. An examination of U.S. Weather Bureau reports from numerous other points, in Texas, Colorado, Wyoming and Montana, proves this extreme variation is typical of most of the Great Plains area, from Canada to the Gulf, from the line showing 20 inches of annual precipitation westward to the Rockies. Deficiency in precipitation may come in any year or series of years. When such drouths occur, grass is scant, feed crops virtually non-existent, and live stock starves or becomes so depleted in flesh that pregnancy falls to a very low rate.

Drouths come in all parts of the United States, but where there is more than 30 inches annual precipitation, usually do not last long. In 1944 there was a severe drouth in an oval shaped area covering thousands of square miles and parts of 10 states, extending southwesterly from western New York to Texas. It held on from mid May till near mid August; but fall rains over most of the area were abundant, pastures recuperated and stock went into the 1944-45 winter in good flesh.

Horses are bred and raised in all states and mules can be, though few mules are raised north of a line drawn due east and west through Des Moines, Iowa.

Low Cost Production Vs. Early Maturity

Experimental work carried out for years at the Missouri and Michigan Agricultural Experiment Stations has proved that under their climatic conditions horses can be grown out with grass and hay only—no grain—from foaling time till 3 years old—and make as large and good horses at 5 years of age (if worked as 3's and 4's with usual pasture, hay and grain rations) as others of the same breeding and excellence that have had grain the first and second winters. In other words, horses will make the full size their inheritance permits, on pasture and hay only, from foaling till 3 years old, providing the soil on which said feed is grown is naturally rich or adequately fertilized with all necessary plant food elements, the pasture excellent and abundant in varieties of grasses and legumes, the hay choice, green, sweet smelling, with a reasonable proportion of legumes in it and the horses are allowed all they can eat. Shelter is not needed save from winds and cold rains; sheds open to pastures are sufficient, summer and winter. Horses will grow well and make full size at 5 years of age, under such conditions: but *they will not attain full size*

at maturity if they do not get adequate feed the year round. On many Western ranges, pastures usually are good from May 1st to July 31st, and fair from August 1st to November 30th; but pasture and hay supplies are apt to be inadequate, both in quality and quantity, from December 1st to April 30th. The result is a stunting of growth. Horses so reared on such ranges never acquire, as yearlings or at any later age, the full size they would have reached had food supplies been ample.

Where early maturity is desired, as in race horses, everything that can hasten their growth is done. The dams are well fed prior to, during pregnancy, and while nursing the foal, and the foals are crowded as fast with good pasture, choice hay and sound grain as the owner or feeder dares. Utmost size and strength at early age is sought. Most Thoroughbred foals are sold when from 15 to 18 months of age, and broken to race soon thereafter, so they can race as 2 year olds. With winter racing, it is not unusual for such foals to be under saddle in competition on the race track as 2 years olds by the time they are 22 months old. Those that are largest, strongest, most mature, and most aggressive may win out their cost in the first few months of racing. This is why conditions prevailing in the Lexington area, or similar conditions in other states where an equally favorable environment has been created, means so much to race horse breeders.

Horses to be raced in harness likewise are pushed for maximum growth, as are saddle bred foals intended for exhibition and sale as yearlings. Pure bred drafters to be shown as foals, yearlings and 2 year olds, also are given all the good pasture, hay, and grain they will stand, to further their chances of winning while young.

With ordinary horses and mules, early maturity is not of sufficient importance to justify high pressure methods. It is essential that they have year-round, plenty of good pasture and hay, grown on naturally rich or well fertilized soil; but grain is not necessary until they are put to work.

Horsemen Need Good Soils

Grass is no better than the soil it grows on. Good pastures for horses should have plenty of legumes mixed with grasses. Land long subjected to heavy winter rains loses plant food elements by leaching. That is why most soils which have more than 30 inches of precipitation annually, usually are lacking in lime (calcium) enough to permit alfalfa to grow; even red clover may not do well. Most soils with less than 25 inches of annual precipitation have a layer of lime at or near the limit of depth of moisture and root penetration, hence have plenty of lime to permit legume growth, but in some seasons may not have enough moisture.

Truog (Wis. Exp. Sta.) says "today liming of land which needs it is accepted as a fundamental and necessary practice by all who are well informed in the matter." He adds—"only one reason for the backward status of liming remains: the high cost of lime.

"The amount of lime to be used, usually ranging from 2 to 5 tons per acre of ground limestone, depends primarily on the degree of acidity of the soil, buffer capacity of the soil, and crops to be grown. Under most general farming conditions in the Northern States, it is advantageous to regulate the application of lime so that the reaction of the soil will be maintained nearly at the neutral point, or close to pH 6.5. At or near pH 6.5 alfalfa and clover grow very satisfactorily, their root nodule bacteria persist well, and conditions are favorable for a satisfactory availability of phosphorus, iron, manganese, and possibly copper, zinc, and boron.

"The root nodule bacteria of alfalfa and sweet clover do not persist well in a soil when its pH value is below 6.5."

Phosphorus—A Pasture Essential

Pierre (Iowa Exp. Sta.) says: "Phosphorus has sometimes been called the master key to agriculture. Its importance in general farming is indicated by the fact that low crop production is due more often to a lack of phosphorus than to the lack of any other element.

"Phosphorus is found in every living cell and is essential in both plant and animal nutrition. In plants it is found in largest concentrations in the seeds, whereas in animals it makes up, along with calcium, the important elements found in the bones or skeleton. Adequate amounts of available phosphorus in soils favor rapid plant growth and development, hasten fruiting or maturity, and often improve the quality of the vegetation. In the Northern States where the growing season is short and early maturity is important, liberal supplies of phosphorus enable corn to mature before it is injured by the early freezes. On the other hand, low phosphorus content in the soil means not only delayed maturity and poor plant growth, but a low phosphorus content of the plant. Animals fed on plants grown in sections of this country and of other countries where the amounts of available phosphorus in the soils are very low, grow poorly and develop diseases that can be corrected only by supplying more phosphorus in their ration."

Lime is needed to make possible the growth of clovers and bluegrass, but it takes available phosphorus to make them grow.

Reynolds (Texas Exp. Sta.) says: "Work conducted at Angleton, Beaumont, Tyler (all with 40 inches annual precipitation or more) and at the King Ranch near Falfurrias (where annual precipitation is about 25 inches) during the last several years has shown definitely that the application of phosphoric acid is necessary for the successful establishment of adapted pasture legumes in the Gulf Coast Prairie and eastern Texas."

The results show that application of phosphate greatly increased the yield and feeding value of the pasture grasses in eastern Texas and all along the Gulf Coast of southern Texas.

Phosphate on Dry Land Ranges

Correspondence with experiment stations in the 17 Western States in June, 1945, disclosed lack of experimental data on phosphate needs of range grasses. General opinion was that there was enough phosphorus for dry land range grasses, though in some areas it might not be sufficiently available. Where stock exhibit a depraved appetite, chewing wood and bones of dead animals, available phosphate deficiency is indicated; if application of superphosphate to such range pastures without any other change in feed brings cessation of such depraved appetites, the need for more available phosphorus on such ranges is proved. Yield of grasses is increased, more desirable kinds develop and they have a higher percentage of phosphorus, where the deficiency has been so corrected.

Testing Soils

When in doubt whether lime or phosphate will increase your grass and live stock yields, check with your county agricultural agent and also write to your state experiment station. If they cannot give you definite information, have your soil tested. It costs but little and is easily done. If tests indicate a shortage of either, apply what is needed to a test acreage—an acre or more—but keep stock off till you have a chance to

see results. Where this is not done, live stock will graze on the fertilized land by preference and you will be unable to see the increase, if any, in yield.

Get Improved Varieties

Also be sure to ask your experiment station about improved strains of grasses suited to your locality, and for the address of the certified seed association in your state. You may find some new grasses that will double or treble your live stock gains per acre. For instance, a variety of brome grass, called Lincoln in Nebraska, and Achenbach in Kansas, starts more quickly, establishes a firm stand a year or two earlier, yields heavier and lasts longer than ordinary varieties. The only way you can be certain of getting the pure Lincoln or Achenbach is through Certified Seed Association growers. The same holds true for other grasses, legumes and grains.

Varieties of oats (Tama, Boone and Vicland) have been evolved that are highly disease resistant, yielding at least 30% more than the best of strains available a few years ago. A still better variety, the Clinton, will be available about 1948. It appears to be at least 25% higher yielding than present improved strains named above. Keep close to your experiment station research. It will pay.

If you purchase only certified seed from growers listed by a state Certified Seed Association, you can be sure of getting the high yielding, disease resistant strains, proved to be such by your experiment station.

Riding Horses Needed in Western States

North and South Dakota, Nebraska, Kansas, Oklahoma and Texas have 408 million acres total land area, of which 345 million acres are in farms and ranches; of this only 101 million acres were in crops harvested in 1939. This means that less than 30 acres out of every 100 in farms and ranches in these states were harvested in 1939.

The 11 states west of the above have 753 million acres total land area, but only 263 million acres in farms and ranches of which but 31 million acres were in crops harvested in 1939. In other words, less than one-third of the total area was in farms and ranches and less than 12 acres out of every 100 in such farms and ranches were harvested in 1939.

This means that most of the land in the 17 Western States was in pasture—mainly range pasture—so it is not surprising that the estimates of the U.S.D.A. for January 1, 1945, show that cattle and calves here totalled 36,560,000 head, of which 7,656,000 were milk cows and heifers kept for milk. It is likely that at least 26 million were beef cattle on ranges.

Conservative estimates from cattlemen of long experience indicates need for at least 20 riding horses per 1000 range cattle, including calves; more in the South where screw worms and other parasites require almost daily inspection of all stock at certain seasons.

From this it is apparent that at least half a million riding horses are in actual use under saddle in these 17 Western States, to look after 26 million range cattle. As many more are in breeding studs—brood mares, stallions, foals, yearlings and 2 year olds—for range work is severe and at least 1/5 of the horses under saddle are discarded or sold every year.

Riding horses for use after cattle are most effective when raised on the ranches where they are to be used: for they become familiar with the land, ravines, rocks and other features of the terrain, which is a distinct advantage, especially at night.

The better ranches, therefore, usually breed and rear their own mounts, often called "cow ponies." Best results are attained where the mares are ridden from 3 till 6 years of age, and then only those that are sound and wise in cattle work, put in the breeding stud. Under such a system, geldings and mares not desired are sold when 7 to 9 years old because younger, better replacements make sale feasible. If gentle, well broken and of good riding type, these "ex-cow ponies" sell at fair prices to people who want everyday, moderate-priced, easy-riding horses.

Work Animals in Harness

Most harness work horses and mules are raised as a by-product of farms. Where annual precipitation is 30 inches or more, diversified farming usually prevails. Farms operated by a farmer and his family predominate. On such farms field work can be well done with grade draft mares. These can raise replacements, horse or mule foals, at slight cost.

Farms thus operated have low power costs, for they raise their work stock at slight expense up to 3 years, when they are put to work. This permits mature work animals, well broken, to be sold, usually for considerably more than it costs to raise them. Investment in work animals, harness and implements for a family size farm is much less than in equivalent mechanized equipment, and operating expenses are less.

Farmers whose sons now are in military service have found it difficult to hire labor to take their place. Consequently, some are now using mechanized equipment. High prices for farm products due to war make it possible to do this without incurring actual loss: but a sharp drop in prices for grains and live stock, probable soon after the war ends, will alter the situation. Lower cash income will force a reduction in cash expenditures, including those for power. High prices on everything a farmer buys will be a powerful stimulus to full use of farm orchards, small fruit, gardens, and the production of meats, butter, chickens and eggs on each farm for family use.

The same principle applies to farm power. Home raised horses and mules, maintained on home raised crops, require less investment than mechanized equipment. Horse and mule feed costs go down immediately when prices for hay, grain and live stock decline. Time saved by using tractors in field work amounts to only a few days per year on a family size farm, if available animals per farm are used with multiple hitches in plowing, discing and harrowing, and does not begin to offset the increased cost of operating mechanized equipment on farms of 160 acres or less.

Men who have mechanized such size farms find the investment and operating cost too great for their acreage, so usually rent or buy adjacent farms. Where grain is raised and sold it is possible for one family, with mechanized equipment, to farm the land formerly held by 3 or 4 families. This has happened and is continuing, wherever farms are mechanized wholly or in large part.

The end result is unfavorable. Continuous grain raising and sale depletes soils. It endangers farm incomes, as unfavorable crop years, due to drouth, flood, frost or hail, may leave such farmers with nothing to sell. Abundant crops of grain, the world over, may drive prices below cost of production. Grains are readily substituted, one for another, so low prices for wheat or oats of which world crops may be very large, carry corn prices down, even though total world crops of the latter may be below normal.

Fewer Farmers, More City Workers

Mechanization means fewer families on the land, in a county, state, or nation. Schools are fewer. Consolidated schools usually are in cities or villages, and tend to educate children away from farm occupations. The farm youngsters desire the modern homes, bathrooms, electric equipment in the home (which they should have) and the shorter hours, greater leisure time, more numerous associates of their own age, and the lighter, cleaner work they see possessed by many of their city or village classmates who have taken town jobs after being graduated. They do not realize that most of the village or city worker's pay goes for rent, food, clothes, and taxes. They do not understand that the margin between income and expense is a narrow one, and that a few months of unemployment in city, town or village may wipe out all savings—leaving a young worker bankrupt. They do not realize that children are an asset on a diversified farm, but a financial liability in town. This is why farms produce and educate far more children than are needed to maintain replacements in farm population, while our cities of 100,000 and over have a much smaller margin of births over deaths. Census figures for 1940, showing births and deaths (by place of residence) per 1000 of population, prove that the increase in total population of our nation comes mainly from farms and from places with population under 10,000.

Work Horses Will Continue in Use

There is every reason to believe that there will be more use of work horses and mules in harness as war ends—and demand for farm products swings back to normal. Where annual precipitation exceeds 30 inches, diversified live stock farming will increase as prices of grains decline.

With more land in grass and hay and less plow land, farms under 200 acres will have 120 acres or less in annual crops and with a sound rotation, can handle the work easily with one horse or mule per 25 acres tilled land. Many such farms, now using tractors, will increase their horses as prices fall and labor becomes available.

Big farms, operated almost wholly with hired labor, will continue mechanized till lessened yields per acre and lower prices render their operations so unprofitable that they quit. Ultimately they will be broken down into smaller farms of size to be operated by one family with little or no hired help.

Animal power for work has survived and will survive because it is lowest in capital invested, is home raised, maintained on farm raised products, and makes users largely independent of outside power sources, strikes and price increases.

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